Professor Fine   **MTH465 Syllabus**   Spring 2024
LARTS-396E
910-6905
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Nexus: Small Worlds & the Groundbreaking Science of Networks
M. Buchanan

Mathematica or equivalent mathematics-programming software

Week of 1/22:
    Introduction
    Small worlds & networks
    Graphs & their computer representations

Week of 1/29:
    Add/Drop/Audit deadline is Monday
    Density, diameter & clustering

Week of 2/5:
    Random graphs (Erdös & Rényi)

Week of 2/12:
    Generation & properties of random graphs

Week of 2/19:
    Presidents' Day *No class Tuesday*
    Mathematical certainties about random graphs

Week of 2/26:
    Pass/Fail deadline is Tuesday
    More on random graphs

Week of 3/4:
    Social networks & and power companies
    Granovetter, Strogatz & Watts
    Midterm exam

Week of 3/11:
    Spring Break

Week of 3/18:
    Generation & properties of Strogatz-Watts networks
    The Internet & the web

Week of 3/25:
    Power law distributions of vertex degrees
    Generation & properties of Barabási-Albert networks
    Paper proposal due Thursday

Week of 4/1:
 Aiello-Chung-Lu models
 Mathematical results
 Paper introduction due Thursday

Week of 4/8:
 More mathematical results
 Withdrawal deadline is Friday

Week of 4/15:
 Patriots' Day *Class* does *meet on Tuesday*
 Paper draft due Tuesday
 Related topics

Week of 4/22:
 Student presentations
 Student presentations

Week of 4/29:
 Paper due Tuesday
 Last class is Tuesday
 Student presentations

The University Studies 5B learning outcomes are that upon completion of this requirement, students will be able to:

- Identify the needs and resources of the communities to which they belong.
- Apply knowledge and skills gained through academic study to real problems and/or opportunities within their communities.
- Describe the connections between learning on campus and the issues and needs of broader academic, professional or civic communities.
- Articulate the value of engagement to other members of their communities.

The community may be professional, scholarly, social, cultural, economic or political.

Those students using the course to fulfill this requirement will give their presentations to an off-campus audience, generally[1] a math class at a local high school. I will facilitate making the required arrangements with an instructor.

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[1]If you wish to present to a different audience, please discuss this with me. You will need to make your own arrangements for the presentation.